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Mental imagery in parasomnias: a study before, during and after treatment

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End-of study report

Introduction

Parasomnias are a severe health problem, which directly affects the psychophysiological status of a significant percentage of the European population. They consist of those disorders arising from abnormal arousal from deep, stage 3 or 4 sleep, such as sleep walking and night terrors, and those arising from REM sleep such as nightmares, REM sleep behaviour disorder and sleep paralysis. Adults suffering from these disorders often report bizarre nocturnal experiences involving behavioural, emotional, perceptual and dreamlike disturbances. Consequences for the sufferers and their families are considerable, and include the dangers involved from automatic behaviour in parasomnias. Sleep disruption has devastating effects on daytime performance and may lead to a vicious circle of performance anxiety, psychiatric comorbidity (particularly depression and anxiety) and an indisputably heavy impact on the quality of life.

Imagery in night terrors is difficult to elicit as most patients have no direct recall; occasionally there is partial recall and we also gain information from partners' accounts of speech and behaviour and overnight video recording. These are of nebulous frightening unstructured images, overlaid with intense fear. Nightmares are much more structured with subjects able to give clear accounts of bizarre and terrifying experiences, and in the rare cases of REM behaviour disorder, the consequent absence of muscle atonia allows these experiences to be acted out. Sleep paralysis also is associated with sometimes terrifying images, often with a component of crushing, perhaps due to the paralysis of muscles during REM sleep. Thoughts during the day about the coming night's sleep are also important, and can strongly affect the subject's sate of mind at bedtime, their quality of sleep, and thus the likelihood of parasomnias recurring.

These disorders are poorly understood and treated at present although some pharmacological advances have been made. a comprehensive treatment protocol which will combine psychotherapeutical and pharmacological approaches will help to improve quality of life in these patients. This needs to embody specific cognitive measures based on the thoughts and experiences specific to this group. This project will gather a unique body of information about The aims of the study were therefore

1) Documentation and analysis of mental imagery reported by a group of patients with these rare disorders in relation to psychophysiological measures of sleep and overnight video recordings.
2) Examination of change in these measures during pharmacological and behavioural treatment of the sleep disorder
3) Preliminary formulation of strategies for cognitive intervention based on these thoughts and experiences.

Methods

The study was conducted according to Good Clinical Practice (ICH) Guidelines and as such received approval from the local Research Ethics Committee. This project started in April 2001 and finished in March 2003. Mr Theo Mazarakis, the research assistant conducting the study, was appointed on 1.4.01 and continued in post until the end of the study. Final approval by the local Research Ethics Committee was received in July 2001.

Subjects

Inclusion criteria were:- aged 18-65, and with a diagnosis of parasomnia. Exclusion criteria were concurrent severe mental illness or substance abuse, but we included those patients with a current diagnosis of anxiety disorder or depression.

Since August 2001 22 eligible patients have been seen in the Psychopharmacology Unit Sleep Clinic in the Bristol Royal Infirmary .Of these 13 agreed to participate in the study. This figure is much lower than was estimated when the study was planned, and this is due to the following reasons:-

1) 4 patients were referred to this specialist clinic from other areas of UK too far away to be seen as follow-up and were assessed, given a treatment plan and transferred to their local services (n=4)
2) 2 patients were serving members of the armed forces and were unable to attend for additional interview
3) 3 patients refused consent

Interviews were conducted on the remaining patients who gave consent. All patients with night terrors and sleepwalking were prescribed paroxetine according to our clinical protocol, and those with REM behaviour disorder or nightmares treated as clinically indicated. If possible, follow-up interviews were arranged after treatment.

Procedures

All patients were assessed by a psychiatrist before entry, and overnight polysomnography and video recording was arranged.

Polysomnography was performed at home using specially designed digital recording equipment which allowed simultaneous video in a split-screen design (Stowood Scientific, Oxford). Sleep scoring according to Rechtschaffen and Kales criteria (1968) and identification of possible parasomnia episodes was performed using Somnologica (Flaga, Reykjavik) and visual scoring. Diagnosis was confirmed at the next follow-up visit.

After written informed consent was given, patients had a semi-structured interview designed to document their recalled imagery during the events. This was of variable duration (45 to 75 minutes depending on the complexity of the disorder), and was divided into two parts. The first part of the interview contained questions assessing the symptomatology of each participant, aiming to confirm the original clinical picture. The second part contained questions that would enable the participants to describe in detail their experiences and expand on the visual and emotional correlates. A detailed record of the interviews was kept. The descriptions of night time experiences were then rated for visual and emotional content by means of discourse analysis. Emotional content was rated by categorization of types of words (neutral or fear words), use of first person and number of adjectives. Visual content analysis used reported objective or subjective angle, vividness of description and image complexity. Finally elements of cognitive integration were identified (see Seligman 1987) Other parameters such as the persistence of feelings upon awakening, the familiarity of persons and surroundings and the frequency of themes were also rated. Using qualitative techniques, themes ensuing from the elicited imagery were identified.

Measures of anxiety and depression status using standard questionnaires were performed (Beck Depression Inventory (BDI), Spielberger Trait Anxiety Inventory (STAI)).

Of the 13 original participants, only 2 agreed to post-treatment interviews. All others were improved in health but dropped out of the study.

Summary results

(Full results given in Appendix 1)

Participants (see table 1, Appendix 1).

Of the 13 patients interviewed, only 8 provided sufficient information for discourse analysis. Of the remaining 5, one patient with night terrors was unable to describe any imagery at all and all of the information about his disorder had been provided by his partner, so no subjective information was available. 3 patients with sleepwalking had no recollection of the events. One patient with post-traumatic stress disorder became distressed and the interview was discontinued at an early stage.

Results of analysis

The main finding of this study was that although patients had no direct recollection of imagery during night terrors or sleepwalking episodes, in many cases there was a dream with strong anxiety features that provided them with a detailed and persistent theme. This in their recollection was associated with the episodic disorder. As is mentioned in the introduction the recollection of imagery following sleepwalking and night terrors has been reported to be extremely partial and fragmentary. However in this study we encountered detailed scenarios that were associated in the subjects' minds with the parasomnias either as nightmares or basis for re-enactment during sleepwalking episodes. These threatening images were almost certainly giving rise to increased anxiety at bedtime and thus were a strong factor in the perpetuation of the episodes.

A further important finding was that in some cases there was the underlying notion from the partners that the patient is responsible in causing or exaggerating the extent of the problem. This may maximize the anxiety of the patient and render any therapeutical approach without the collaboration of the partner and/or family less effective.

Conclusions

The study offers sound support to the notion that the same cognitive tools that are used to treat both anxiety disorders occurring during waking, and persistent nightmares such as the method of (Canadian guy*) may be useful in the treatment of non-REM nighttime disorders such as night terrors. Full co-operation of partner and or family may be necessary for adequate engagement with these treatment processes.

Outcomes

1) A preliminary presentation of the polysomnographic results was presented as a poster at the British Sleep Society.
2) It is hoped to present this exciting data at a future meeting of the European Sleep Research Society.
3) Presentation at the Bristol Sleep Interest Group is scheduled for September 2003.
4) A summary of the main report, structured for the lay reader, will be circulated to the subjects who took part in the study and will be available for clinicians to give to future patients if appropriate. (See Appendix 2).

Financial report

See Appendix 3

Signatures

Grant holder....................................... **Head of Department.......................**

Dr S J Wilson **Professor David Nutt**

19/6/03

Mental imagery in parasomnias: a study before, during and after treatment

Appendix 1

Scientific report

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Results

Table 1. Clinical characteristics.

Participant I.D.	age	Diagnosis	STAI score	BDI score
1	42	NT+Ni+Sw	56	7
2	32	NT +Sw+ Ni	47	8
3	34	NT +Sw+ Ni	47	4
4	20	NT +Sw	40	3
5	28	NT +Sw	-	-
6	60	RBD (Ni)	40	3
7	58	NT + Ni	46	9
8	23	NT +Sw	42	2
9	18	NT + Sw	Not available	Not available
10	33	Sw + NT	Not available	Not available
11	65	PTSD (Ni)	41	10
12	22	NT	Not available	Not available
13	20	Sw + NT	Not available	Not available

NT: night terrors: **Ni**: nightmares; **Sw**: sleepwalking

STAI: Spielberger Trait Anxiety Inventory; **BDI**: Beck Depression Inventory

Table 2 Anxiety features

Participant	1	2	3	4	5	6	7	8
Persistence of images/feelings upon awakening	High	High	High	Low	Low	Medium	High	Medium
Frequency of themes	High	High	High	High	Low	Low	High	Low
Neutral	Low	Low	Low	High	-	Medium	Low	Medium
Threat	High	High	High	Low	-	Medium	High	Low
Familiarity of surroundings	High	Low	High	High		Low	High	Medium
Bad conclusion	High	High	High	Low		Medium	High	Medium
Good conclusion	Low	Low	Low	Medium		Medium	Low	Medium
Violent episode	High	Medium	High	Low	High	Low	Medium	Medium

Persistence of images/ feelings upon awakening: This feature is associated with the nature and perceived impact of the episode. In the cases that the persistence was high the imagery had strong associations with the life events of the person or the episode was of a nature that cannot be ignored by the partner or family present. Furthermore the cognitive integration of the episode would increase the persistence of the feelings.
Frequency of themes: This feature implies a fixation on a theme which in that case does not replicate a real event but has gained a permanent semantic association and therefore increased importance in the mind of the patient. The patients suffering from night terrors reported insects, spiders or unidentified insect like entities crawling in the bed or in the dark corners of the room. Only one patient identified a sound associated with the presence of creatures. This type of visual hallucination may reflect a common fear of insects or may be related to the effort of focusing in a dark room. Generally sound was not present in the imagery and not in a repetitive or consistent form whatsoever.
Neutral or threat: The imagery is perceived as neutral or threatening and that is supported by a number of fear words used by the patient.
Familiarity of the surroundings: A familiar setting indicates again the perceived relation of events to the real life; being a locus of relative security it maximizes the impact of the threat.
Conclusion: Often dreams are interrupted before a rational ending as a defense mechanism towards life threatening imagery. Here the conclusion is rated accordingly to the opinion of the patient only and not interpreted by the interviewer.
Violent episode: This refers to real violent episodes occurring during the patient's parasomnia, eg attacking bed partner or striking self or others. This is included here because danger of inflicting physical harm to himself and to others increases the anxiety of the patient over his nightly behaviour.

In tables 3, 4, 5 (analysis of imagery content) ratings are based on the type or number of the words used, the structure of the sentence or the occurrence of specific types of imagery. Although different ratings have been used for each item they have been grouped under the "high" "medium" and "low" labels to ease visual presentation. The individual ratings are explained below each table.

Table 3. Emotional content.

Participant	Fear words (incidence)	Fear words (content)	Neutral Words	Use of first person	Number of adjectives
1	High	High	Low	High	High
2	High	High	Low	High	High
3	Medium	High	Low	High	Low
4	Low	Low	High	Medium	Low
5				-	-
6	Medium	Medium	Medium	Low	High
7	High	High	Low	High	Low
8	Medium	Low	Medium	High	Low

Fear words (incidence): The incidence is rated based on the presence of fear words in sentences describing the imagery. One fear word per sentence would be 100%, therefore "high" incidence. Low is rated at 0-25% and medium at 25-50%

Fear words (content): The content rating depends on the nature of words ranging from *horrifying* or *petrified* (high) to *disturbing* (medium) to *troubling* (low). The percentages are as previously mentioned.

Neutral words: can be positive or not demonstrating any level of threat. These are rated according to their occurrence per sentence.

Number of adjectives: This is based on the number of adjectives used per sentence. Again one adjective or more per sentence would be 100%. It can be argued that this numbers reflects the verbal skills of the patient, but adjectives are also one of the few lexical tools to provide a sentence with emotionality.

Table 4. Visual content.

Participant		1	2	3	4	5	6	7	8
Visual angle objective		H	H	L	L		M	L	L
Visual angle subjective		L	L	H	H		M	H	H
Level of detail	Humans	M	M	L	L		H	L	L
	Animals	L	M	L	L		H	L	L
	Form	M	M	M	H		H	L	L
	Texture	M	H	H	M		H	L	L
	Colour	L	H	H	L		H	L	L
	TOTAL	M	H	H	L		H	L	L

H High. M Medium L Low

Visual angle: The angle determines usually the level of involvement. An objective angle protects the viewer from the immediate impact of the events, but it can be also an indicator of feelings of inability to interfere with the events. The ratings reflect the presence or absence of a visual angle; a high rating means that the specific angle is predominantly used in the imagery. There was only one case with a double angle at the same scene.

Level of detail: This is a series of ratings representing the vividness and accuracy of the imagery. Although the number of adjectives is again used as a base measure the rating is incorporating the impression of the interviewer and the quality of the visual content transmitted. Since there are many non-lexical elements in a description e.g concerning size or distance the physical part of the description weighs upon the ratings. It can be argued that thus the accuracy is undermined but it is the opinion of the authors that the omission of non-lexical elements would distort the truth of the rating even more. The *Level of detail:* Total depends on the previous ratings but does not represent an average since there were cases when one of the ratings (e.g. animals) was not applicable. According to Seligman (1987) the level of visual detail represents these elements of the imagery that constitute the primary visual input (not subjected to cognitive interpretation).

Table 5. Cognitive interpretation.

Participant	Transitions	Rationalization	Occluded features	Undefined settings
1	High	Low	High	High
2	High	High	Medium	Medium
3	Low	High	High	High
4	Low	Low	Low	Low
5				
6	High	High	High	Low
7	High	High	High	Medium
8	Low	Low	Low	Low

As mentioned in the relevant chapter Seligman (1987) proposed that there is a cognitive process that takes place after dreams, integrating visual and emotional elements. This process is revealed when the participant cannot remember secondary features that he implied that were present. transitions between scenes and also by deducing rationality and cause and effect relations where not evidently present. The rating here is based on the number of these elements but also reflects the impression of the interviewer as explained earlier.

Transitions : This rates the cases where two unrelated scenes are put together in a time frame with a loose binding of which there is poor or no recollection.

Rationalization: The case where a causal relationship is proposed by the patient but not evident from the imagery; e.g. the patient whowas walking with a dog and tried to avoid the tide said that she was trying to save the dog, but the animal was not present in the latter part of the dream.

Occluded features and undefined settings: Both these elements refer to persons or objects which, while not taking part in a dream, are there to support the contextual frame. Usually there is very poor recollection of these elements.

Interpretation of results

The imagery elicited from night terrors partially corroborates the observations by Llorente (1992) on the partial, uncertain and volatile nature of the recollection of such images. 4 out of 8 patients reported uncertain images of small insect-like creatures or undefined movement in dark corners of their rooms or on their beds. These reports may be related to emotional strain and feelings of immediate threat and are associated with our instinctive fear of the dark. They probably arise from the inability to focus in the first moments after awakening in a dark space. It is nevertheless important that the reports of images are of a highly anxiogenic nature, usually representing the worst-case scenario about what could be lurking in the dark.

A similar remark can be made in the case of sleepwalking where there was partial or no recollection of the event for 5 out of 7 patients and no associated imagery for four of them, in accordance with the literature so far (Kales et al., 1980). However, half of the patients presented recollections of a highly detailed and structured imagery related to their nighttime experiences.

Regardless of the extent of recollections the predominant feeling in all the patients was that of anxiety characterizing everything around their nighttime life. It has been noted before (Fisher et al., 1974; Kales et al., 1977) that this is one the main features in parasomnias but here furthermore it extends to the hours preceding sleep and to those following it. Anxiety here is described with fear over what could occur the following night and feelings of frustration and guilt on the next morning mainly concerning the relations of the patient with his or her partner and family. It has been noted (Ohayon, 1999) that the partners and families of patients, however supportive they are do not consider parasomnias in the same manner as other disorders or health problems like e.g. ulcer or lower back problems. This may be is due to:-

1) the nature of parasomnias and the contextual framework of all sleep disorders
2) the lack of information and the mythical dimensions of anything related to sleep, and
3) the fact that for any observer the situation is "surreal", and remains as such until medical confirmation of the disorder which usually provides the event with more realistic dimensions.

The first feature that was studied with regard to anxiety was the persistence of images and feelings in the hours following the episode. The persistence of a memory means that it is still elaborated (Stickgold, 2000) and constantly interacts with the cognitive processes underway.

The same can be said for the images and the ensuing feelings. It is not strange that the patients who had a high rating in that element were also highly rated for frequency of themes and level of threat. In one case the persisting image was related to a traumatic memory in his life, and could be interpreted as incomplete processing of the particular memory (Brewin et al., 1996; Ehlers & Clark, 2000). In a similar way the persistence of imagery from the nighttime experiences can be viewed as a result of incomplete processing and that is corroborated by the persistence of the themes. In addition to that the feelings accompanying the imagery were still present the next morning, resulting in a constant interaction between the events of the night and those of the day. This seems to replicate the "vicious circle" effect that has been proposed (Espie, 2001) for other anxiety related sleep disorders, a self perpetuating mechanism triggered by the original disturbance and generating anxiety which maintains the disturbance or renders coping with it an almost impossible task.

Another point of interest is the protective mechanism or in some of these cases the lack of one, which seems to exist in our imagery. Hall (1953) in his extensive study of themes in dreams reports that the case of somebody seeing himself dying or suffering fatal damage is extremely rare, if not non-existent, since the mind tries to protect us from exposure to a traumatic condition difficult to process. Even in the most agonizing of nightmares we seem to get away before the end or simply wake up. The ensuing feelings refer usually rather to the certainty of an unwanted outcome than the witnessing of this outcome. 3 patients in the present study had full recollections of the bad conclusion of their imagery as if this protective veil were not in place, perhaps replaced by a model of learned helplessness. The violent nature of some episodes unavoidably increases the levels of anxiety; the danger of inflicting harm to self or others and the ensuing guilt result in a higher occurrence of episodes in the following days. This was the case of participant 1, and confirms the association between daily anxiety and nighttime disturbance (Celluci and Lawrence, 1978; Kellerman, 1979, 1980).

Other elements of the dreams were studied according to the conceptual framework on dream composition proposed by Seligman and Yellen (1987). Their theory is mainly concerned with the structuring of the dream and the process of cognitive integration that happens during the experience of it; this was also our main focus. The first element of the imagery is the emotionality; the emotional attributes of the composition that weigh upon the recollection of the experience. The incidence and content of fear words reveals the strong emotional impact that still persisted on the time of the recollection, and this in turn coincided with the use of first person by the patients. They could not distance themselves to the role of narrator, exactly in the manner of a person who attempts to recount a traumatic incident of his waking life (e.g. Loftus, 1993). The fine line of distinction that is usually revealed between the narration of a real and a fictitious event was not present during these recollections. This seems to justify the observations of Fisher (1974) about the similarities of some features of parasomnias to a psychotic episode.

The second element is the visual content of the imagery; there is a great variation here in the level of detail concerning the forms and textures. Usually the vividness of the recollections referred to the active elements of the image and not the surroundings, a fact that implies a composition added to the original visual element. Nevertheless the subjective visual angle is used in the most frightening imagery exactly in the same way as for the emotional aspect. Everybody who has seen a thriller knows that "something is about to happen" when the viewer is forced to quit the relatively more relaxed third person angle and identify with the actor through a first person view. In only one case there was a simultaneous subjective and objective angle; but in that case the objective angle functioned as a form of further self-recrimination since the participant considered herself responsible for the situation she was in.

The most interesting element for the aims of the present study was the third, the features that imply cognitive integration. It is our belief and also a strong trend in the relevant literature (Kales, 1977) that nighttime imagery is not only interpreted but also structured on the basis of the cognitive mechanisms of the individual and that the dysfunction of this mechanism perpetuates the vicious circle of anxiety. These features include the transitions between consecutive scenes, the points revealing rationalization and the existence of peripheral elements that offer a workable canvas without being immediately and accurately remembered. An example of rationalization can be seen in the following narration

"There is this man waiting in the corner, he is probably wearing a hat ...I cannot see his face...he is after my wife and she is running...I think she is screaming but there is no sound"

"Do you see him approaching or chasing her?"

"...no I don't see him at all but I know he is after her because she is constantly looking back...".

The two people in the dream do not coexist in the same frame but their interaction and their relative roles are assumed by the patient: this accentuates the threatening tone of the dream.

There are similar assumptions evident in other narrations and they always seem to increase the sense of threat and the resulting anxiety. As is mentioned above the recollection of imagery following sleepwalking and night terrors is extremely partial and fragmentary. In this study we encountered detailed scenarios that precede the disturbance either as nightmares or basis for re-enactment during sleepwalking episodes. This fact combined with the prominence of anxiety features in the imagery is potentially offering a sound support to the notion that the same tools that are used to treat the ones occurring during the waking life should address nighttime disorders.

In some cases there was the underlying notion from the partners that the patient is responsible in causing or exaggerating the extent of the problem. And all this inevitably maximizes the anxiety of the patient (Harvey, 2002) and renders any therapeutical approach without the collaboration of the partner and/or family less effective.

Limitations of the present study

There were two main limitations to the present study, the first being the number of participants and the second the willingness of the participants to give second interviews.

Conclusions

The focus of this study was the imagery associated with parasomnias and the effect and integration of particular themes to the conception of the night time experiences of parasomniac patients. The findings strongly imply that nightmares or persistent anxiety dreams are incorporated by the patients to the corpus of the disorder thus triggering a vicious circle that is one of the factors maintaining and perpetuating the disorder.

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Mental imagery in parasomnias: a study before, during and after treatment

Appendix 2

Lay summary

We studied adult patients who were suffering from rare sleep disorders such as sleepwalking, night terrors and REM behaviour disorder, which interfered with their lives and caused them sufficient distress to prompt them to seek medical help. We recorded their sleep with brainwave measurement and video recording in their own homes, to decide which specific disorder they were suffering from, and we interviewed them in depth to try and establish what they experienced during the attacks and what effect it had on them emotionally.

The interviews revealed that although many patients had no recall of the actual episodes, they did have additional dreams and night-time anxieties which they associated with their sleep disorder, and which might have increased their fear of their episodes. These often included images of insects, or of horrific situations about to happen, and nearly always were accompanied by feelings of helplessness and loss of control. In-depth analysis of the interviews has provided a valuable body of information about these rare disorders and a basis for planning appropriate psychological treatments to complement the pharmacological approach currently employed. This additional treatment would focus on the patients' fear of the coming night and the episodes themselves, which may be aggravating or perpetuating the disorder.